NASA
Discovery

Return to Flight
SPOTLIGHT
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SPACE SHUTTLE DISCOVERY

Discovery's airlock is lowered toward the orbiter's payload bay for installation.

Technicians install a Reinforce Carbon-Carbon panel on the right wing of Discovery.

Bead blasting completed on the leading edge of the right wing of the shuttle is shown to Shuttle Program Manger Bill Parsons (center).

Cover Photo: *Viewed from inside the Vehicle Assembly Building (VAB), Space Shuttle Discovery, atop the mobile launcher platform (MLP), begins its rollout to Launch Pad 39A before dawn.*

Preparing for Return To Flight

NASA's fleet of Space Shuttle orbiters is maintained and processed at the Kennedy Space Center in Florida. Discovery (OV-103) is designated the lead vehicle for Return To Flight and is one of three reusable spaceships that call Kennedy "home."

Following manufacture in California, Discovery arrived at the seaside launch site in November 1983 before the first of its 29 space voyages in 1984. Discovery later was joined by its sister spaceships Atlantis (OV-104) and Endeavour (OV-105).

The Kennedy Space Center workforce processes and maintains the three Space Shuttles before launches and after landings. Maintenance and upgrades are performed at scheduled intervals, much like service to personal automobiles. Each Orbiter Vehicle has a "garage" known as its Orbiter Processing Facility where technicians and engineers prepare them for space flight.

Discovery is being prepared for Return To Flight while Atlantis is readied for the second mission. Endeavour currently is undergoing an Orbiter Maintenance and Modification period - a more extensive overhaul prior to mission processing for flight.

Discovery's flight preparation includes inspection of every system and structure, including the vehicle's Thermal Protection System (TPS). Several types of TPS on all external surfaces protect it during reentry. In addition to the more than 30,000 individual thermal tiles and blankets, there are 44 Reinforced Carbon Carbon panels (22 on each wing leading edge), and a nose cap that protect the Shuttle from the extreme heat of reentry.

During inspections, all of Discovery's wing leading edge panels were removed and inspected through nondestructive evaluation at the manufacturer in Dallas, Texas. These tests included X-ray, ultrasound and eddy current to ensure structural integrity prior to installation on the vehicle. Work also was performed at Kennedy, including the removal and inspection of all associated panel attach fittings.

Technicians used a process called "bead blasting" for the first time to address corrosion areas on Discovery. Bead blasting is a process that uses a pressurized pneumatic gun containing silica carbide, plastic pellets or glass beads to remove primer, paint and corrosion from Orbiter vehicle surfaces. This is one of many examples of the diligence being applied to ensure the spacecraft is ready for flight.

NASA's Space Shuttle Program and its contractor workforce continue to work toward a safe Return To Flight of Discovery, Atlantis and Endeavour beginning in 2005, with an eye toward completing assembly of the International Space Station.

Statistics:

Size:	122 feet long (37.2 meters)
Wingspan:	78.1 feet (23.8 meters)
Weight (dry):	176,419 pounds (kilograms)
Weight (at liftoff):	4.5 million pounds (2,041.2 kilograms)
Speed-one minute after liftoff:	1,020 miles per hour
Velocity in Orbit:	17,500 miles per hour
Engines:	3
Engine Thrust Power:	394,260 pounds each at sea level at 104 percent (off website)
Capacity of Vehicle:	Up to 8 Astronauts/Mission Specialists

For more information visit the NASA website at http://www.nasa.gov

"Discovery was named after two historic sailing ships: Henry Hudson's, which searched for a northwest passage between the Atlantic and Pacific Oceans in 1610 - 1611, but discovered the Hudson Bay instead. The other was Captain Cook's, which discovered the Hawaiian Islands and explored southern Alaska and western Canada."